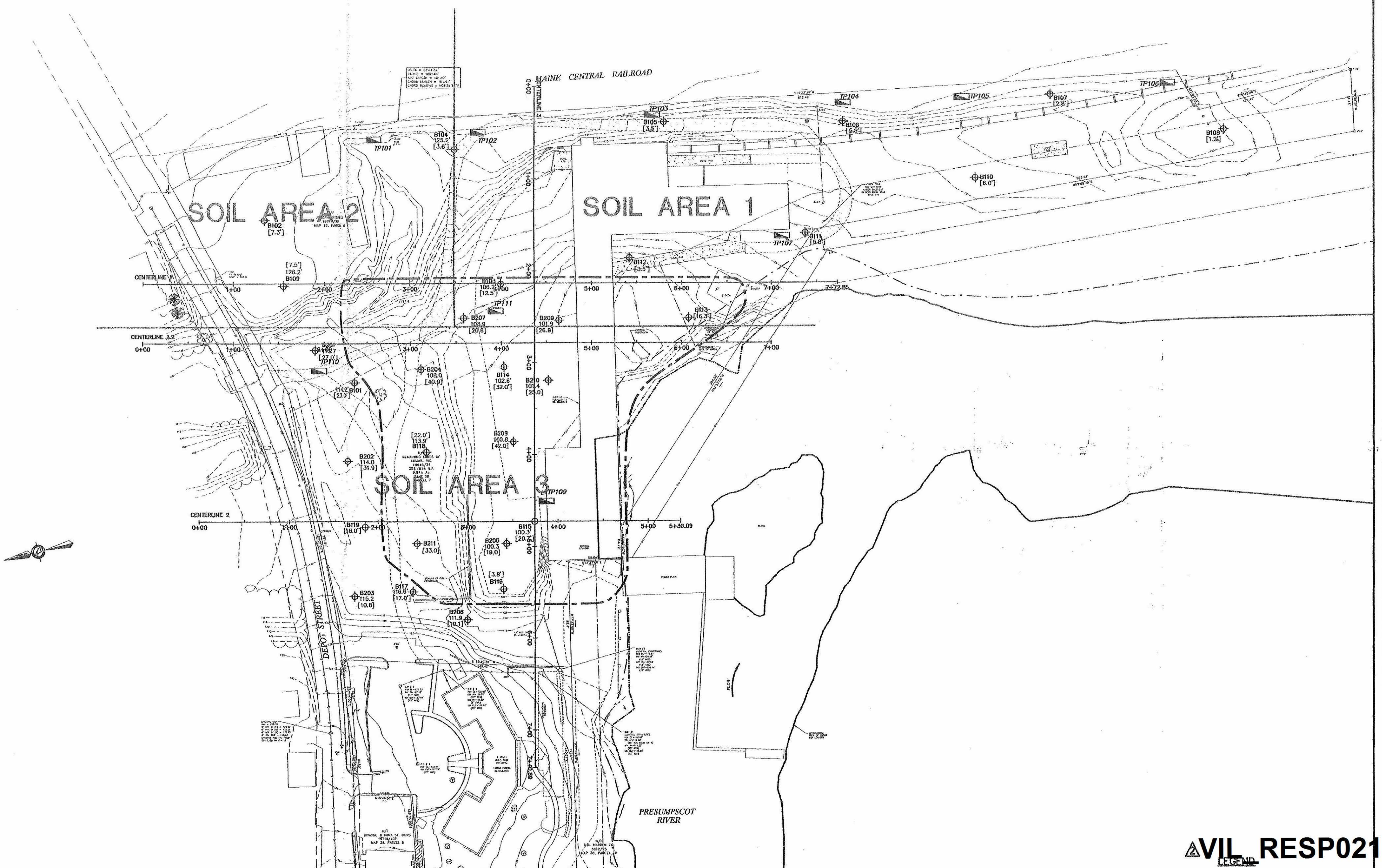

NOTE:

THIS PLAN IS PROVIDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITELD 'GEOTECHNICAL INVESTIGATION REPORT' AND 'SUPPLEMENTAL INVESTIGATION REPORT' DATED FEBRUARY 27, 2007 AND JUNE 1, 2007, RESPECTIVELY.

LEGEND

(dashed line)	APPROXIMATE LIMITS OF SOFT CLAY & ORGANICS
B205 ⌖	TEST BORING
100.3	GRADE ELEVATION
[19.0]	DEPTH TO REFUSAL
TP101	TEST PIT

Site:

VILLAGE AT LITTLE FALLS

13 DEPOT STREET
SOUTH WINDHAM, MAINE

Prepared for:

NORTHEAST CIVIL SOLUTIONS
153 US ROUTE 1
SCARBOROUGH, ME 04074

STATE OF MAINE
PAUL D. DESTEFANO
LICENSED PROFESSIONAL ENGINEER

0 25 50 100
SCALE in FEET
1"=50'

OAK ENGINEERS
Brown's Wharf
Newburyport, MA 01950
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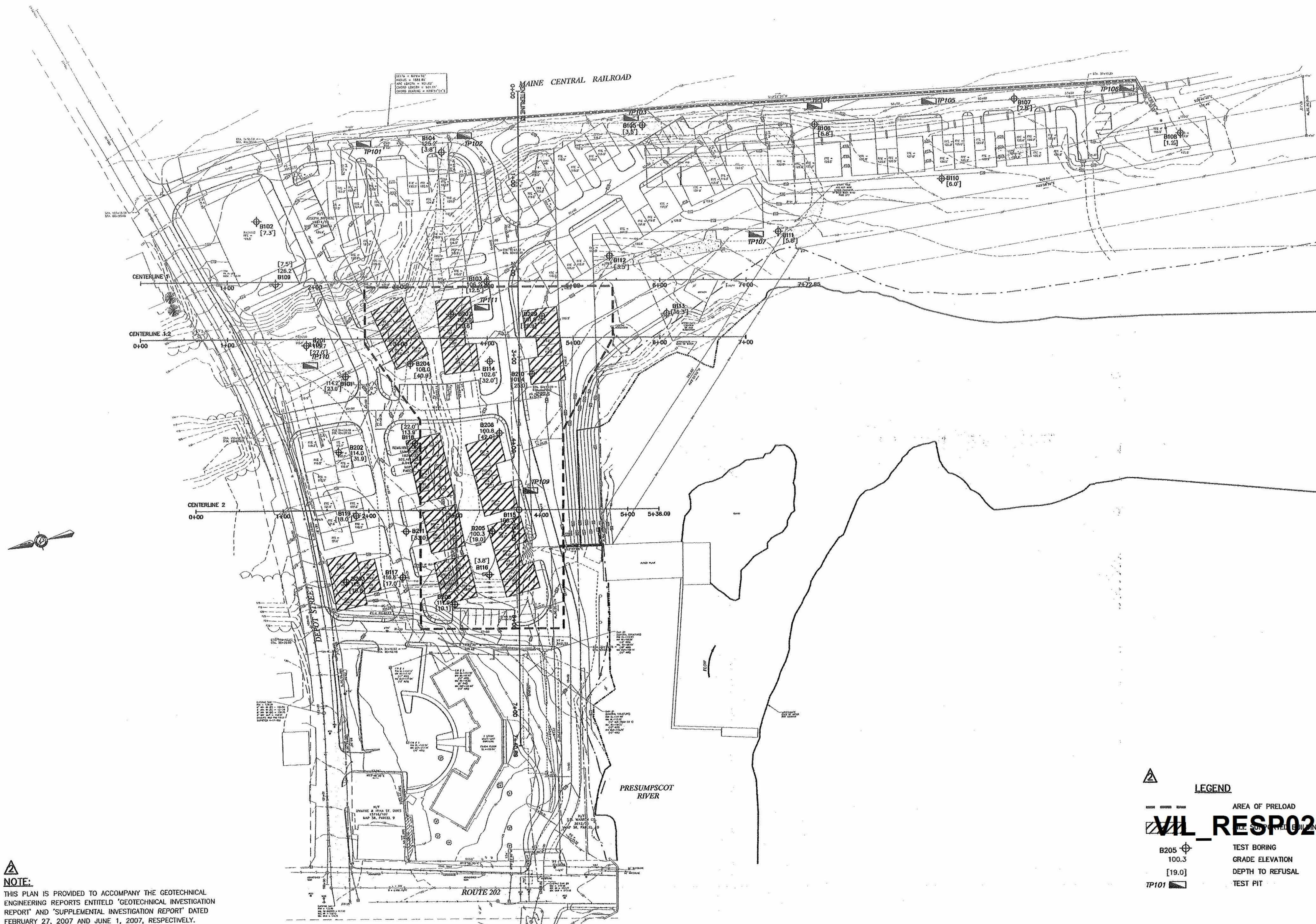
SUBSURFACE EXPLORATION PLAN

	Revision/Issue	Date
2	REVISED PER DEP	6/07
1	SUPPLEMENTAL INVESTIGATION	5/07

Design by: DEG	Checked by: PDD
Drawn by: DEG	Approved by: PDD
Project: 064006	Date: MAY 2007
Sheet: C1.0	



NOTE:

THIS PLAN IS PROVIDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITELD "GEOTECHNICAL INVESTIGATION REPORT" AND "SUPPLEMENTAL INVESTIGATION REPORT" DATED FEBRUARY 27, 2007 AND JUNE 1, 2007, RESPECTIVELY.

LEGEND

— — —	AREA OF PRELOAD
(hatched)	PILE SUPPORTED BUILDING
B205 ⌖	TEST BORING
100.3	GRADE ELEVATION
[19.0]	DEPTH TO REFUSAL
TP101	TEST PIT

Site:

VILLAGE AT LITTLE FALLS

13 DEPOT STREET
SOUTH WINDHAM, MAINE

Prepared for:

NORTHEAST CIVIL SOLUTIONS
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STATE OF MAINE
PAUL D. DESTEFANO
PROFESSIONAL ENGINEER
5/25/07

0 25 50 100
SCALE in FEET
1"=50'

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PROPOSED PRELOAD AND PILING PLAN

No.	Revision/Issue	Date
2	REVISED PER DEP	6/07
1	SUPPLEMENTAL INVESTIGATION	5/07

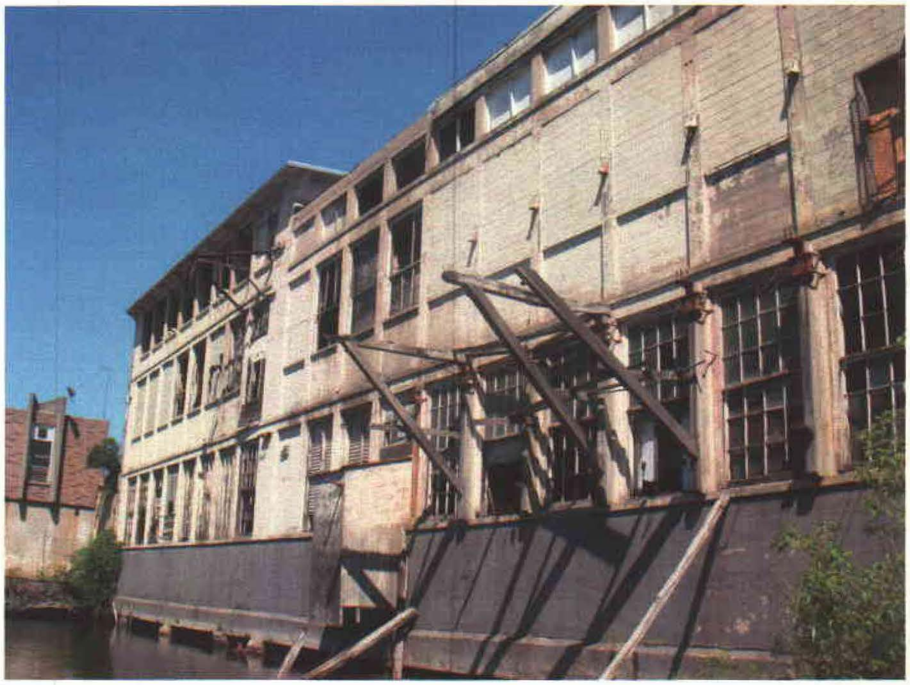
Design by: DEG	Checked by: PDD
Drawn by: DEG	Approved by: PDD
Project: 064006	Date: MAY 2007

Sheet: C3.0

Foundation Assessment and Seismic Review
Keddy Mill, South Windham, ME
Resurgence Engineering Project Number 08-027

PERFORMED FOR

Northeast Civil Solutions
153 U.S. Route 1
Scarborough, ME 04074



Final Report
February 11, 2009

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

Summary:
The foundation structure at the Keddy Mill in South Windham is in good to fair condition, considering age and construction type. Water, sun, and ice have taken a toll on the lower-level concrete slabs and grade beams, causing corrosion, frost heaving, undermining, and distortion.

Though we reference eastern portions of the longer mill building in this report, the project work area considers the mill portions west of column line "21" as shown on Schematic Plans included in Appendix A.

As is often the case with building rehabilitation projects, many factors need to be considered. Economic justification, planning issues, site safety, usage patterns, and environmental issues all factor into the final decision about the best way to improve the property in question. Some rehabilitation items, although not immediately necessary to restore, repair, or replace, may need to be addressed earlier to avoid repeating or complicating future work.

The study area consists of two buildings. The eastern building measures approximately 143' x 38' clear inside. Two floors of housing could be placed in the upper story (10,868 gross square feet), and the rehabilitated parking level could reasonably accommodate approximately 12 cars. The western structure measures approximately 73 feet by 76 feet clear inside. Two upper floors can accommodate approximately 11,096 gross square feet of housing. Parking space in this structure would be limited to two vehicles, due to the incoming vehicle ramp and the large existing boiler that is currently assumed to remain in place.

We believe that foundation repairs to this structure will cost approximately $885,500. This figure considers a 10 percent construction contingency on $700,000 worth of subcontractor work and 15 percent General Contractor Overhead and Profit on top of the subcontractor work plus contingency. It does not consider design fees, construction administration fees, or testing and inspection fees related to this work. It also assumes that this work is part of a much larger construction project, and that these structural repairs are a relatively minor component to that large-scale scope of work, thereby reducing general conditions costs.

While zoning requirements will likely dictate the number of parking spaces required for each unit, we could conservatively say that 14 housing units could fit into the given square footage at 1,000 square feet each.

21,900 gross square feet x 0.8 circulation factor = 17,520 square feet

17,520 square feet x 0.85 partition and walls factor = 14,892 square feet net (14, 1,000 sq. ft. units).

Based upon these assumptions, the ***structural*** costs related to obtaining 14 parking spaces and 21,900 <u>gross</u> square feet of housing are approximately $59 per gross square foot of living space, or $63,200.00 per unit considering 14 units.

We have not taken into account construction of other structures, such as ancillary elevator towers, staircases, or site parking amenities required for the number of units that you can fit within the provided space. This does not include necessary finish costs, such as painting, window replacement, and fireproofing, that will be required in the basement space to comply with the requirements of NFPA 101, the Life Safety Code, which is enforced throughout Maine. It also does not include costs for the numerous areas of the existing upper floor that will need to be patched, strengthened and/or infilled in order to safely separate the basement floor from the residential floors above.

Site, Topography, and Subgrade
The mill is sited in a backwater eddy of the Presumpscot River. Prior to construction of the mill, it appears that the existing grades were much lower than they are today, based upon the amount of debris that has been found in fill brought to the site around the land areas of the building perimeter. Below this loose granular fill that contains construction debris, there are native clay deposits, sand strata, and silts that vary in depth to bedrock below.

Lateral Loading Design Issues:
Change in occupancy of this now-vacant structure, and the extent of work that must be performed, currently dictate that the existing structure conform to the requirements of the 2003 International Building Code and/or the 2003 International Existing Building Code. Maine has adopted a statewide building code, to be enacted in 2010, that will be based upon the 2009 IBC. Structural loading should be reviewed for that code when it is implemented because seismic and wind maps will be revised when that code goes into effect.

Gravity loads proposed for this building are of little structural concern, since residential housing loads and light vehicular parking will clearly be less than the heavy industrial loads the building carried in the past. If the long east section of the mill is filled with two levels of housing (it appears that three levels simply would not fit), then a reasonable anticipated amount of live loading could be considered to be 80 pounds per square foot. If conventional lumber framing is used to build the housing inside the existing mill shell, the total dead load from two floors plus an insulated ceiling below the existing roof is approximately 35 psf. The total dead plus live load of 115 psf is far less than the heavy industrial loadings imposed on the structure while it was used as a mill.

Wind loading review conservatively considered the worst-case scenario of wind blowing directly up the Presumpscot River from downstream at a time of low river depth. The applied wind blows against the tallest wall of the building, the south wall. We compared the approximate wind load on the south wall to the corresponding seismic load on that wall for an earthquake in the same direction. The two loads were quite similar in magnitude, with the seismic load being slightly larger due to the presence of an extra floor in that part of the building.

Piers and Visible Grade Beams
Based upon available elevation survey measurements, the building has not experienced significant differential structural settlement, though it appears that there is some subsidence of the building near the "33" and "30" lines. Water levels and visible structural distress along the south wall grade beam indicate settlement, or that the grade beam was not built level. Although the building may have settled, soils below existing foundations are likely consolidated at this time, and future differential settlement should not be large, barring significant long-term changes in river levels.

At least part of the building appears to be founded on concrete piers encased in timber cribbing. To develop a better understanding of the foundation, Summit dug a test pit along the south wall at the "24" line. The depth of the "pilecap" at that location, along with the depth to ledge determined from adjacent test borings, indicates that the building is supported on square piers that bear down to ledge. We could not confirm this construction technique in the river because of water depths.

Grade beams support the exterior foundation walls and columns above. The South wall grade beam, over the Presumpscot River, shows obvious signs of structural distress near the "40" "39", "36", 33", and "30" lines. The South Wall grade beam will require repair and strengthening, and possibly additional support piles. We observed what appears to be exposed structural steel in the grade beam over the Presumpscot

River. The bottom face of this grade beam has experienced spalling and corrosion. Repairs and future corrosion protection perhaps supplemented by impressed current cathodic protection, will be required.

Some of these repair costs offset costs for demolition of the entire existing mill structure in this area. Therefore, the final cost needs to be weighed against the demolition cost for the entire existing structure, and the costs associated with construction of retaining structures to control flooding in the area of the existing building.

Basement Foundation Walls and Slabs

The westernmost retaining wall, closest to the dam, is in poor condition and will require substantial structural strengthening. It will be necessary to build a completely new wall inboard of the existing western wall, using a combination of lateral soil anchors, grade beams, and new piles to properly support it. The massive boiler structure may also prove useful as a means to brace this new inner wall. Keep in mind that the alternative that considers completely demolishing the mill still carries a significant cost associated with stabilizing the existing basement retaining wall. It is likely that that cost exceeds the $250,000 cost included in this estimate because of additional disturbance to the neighboring power plant. As we discussed, that cost was earlier discussed as approaching $450,000.00.

If the eastern mill building is demolished east of the "21" line, there will be a cost associated with providing a new end shearwall at this location. We have carried that cost assuming that it can be tied into the existing concrete columns and pilecaps.

The long east-west basement walls are generally in good condition. However, they will likely require some lateral bracing to help distribute north-south wind and seismic forces because the upper floor structure does not directly brace these walls. Instead, the columns supporting the upper floor rest on top of the wall, providing less lateral stability at the upper floor. Performing this structural upgrade is relatively straightforward.

Floor slabs require substantial repair, in both elevated and on-grade areas. Additionally, it will be necessary to install some sort of vapor barrier on, below, or above the existing slabs to minimize moisture intrusion through the concrete into the garage space. It will be impossible to keep all of the moisture out of the basement space. The best that can be anticipated is a way to mitigate and control moisture.

As a modified approach to our earlier slab repair strategy between lines 21 and 40, we are now considering placing a new structural slab on top of the existing. This will help increase the vapor permeability of the overall garage space, level the slab heights between the north and south halves of the long mill building, and provide a better finish on the garage floor.

2.0 INTRODUCTION

At the request of Lee Allen of Northeast Civil Solutions, (NCS), Resurgence Engineering and Preservation, Inc. (RE&P) performed a structural evaluation and rehabilitation feasibility study for the Keddy Mill Building Foundation in South Windham, Maine. Alfred H. Hodson III, P.E. provided these services and wrote this report, with the assistance of NCS (building spot elevation survey) and Summit Environmental Services (soil testing and concrete testing).

Based upon available information, the building was built in the late 19th or early 20th century. Best estimates by NCS place the concrete mill construction between 1900 and 1913, though an earlier brick mill structure likely existed before that.

In the summer of 2008, Alfred Hodson met with Lee Allen and Steve Etzel to discuss project goals. In September 2008, Alfred Hodson visited the site several times to gather information necessary to assess the building foundation. We agreed that the general scope and intent of the evaluation and of this report is to:

a. Inspect and evaluate accessible portions of the building foundation structure from inside and outside;
b. Review existing geotechnical information on the site and supplement it with soil borings as necessary to determine existing foundation conditions;
c. Test foundation concrete to determine condition and strength;
d. View underside of elevated slab structure that extends over Presumpscot River;
e. Photograph the building structure and façade to document significant features and deficiencies, and provide approximately 30 photos with the report;
f. Meet with NCS to discuss the findings;
g. Submit a draft report for review;
h. Submit two bound original copies and one unbound copy of the report.

Appendix A of this report contains as-built foundation plans based upon available information, showing the structure and deficient framing and foundation areas. Appendix B provides photographs relevant to the report. The report and appendices should be read in their entirety. Some photos shown in the appendices may indicate damage not specifically mentioned in the report.

Inspection began in early September 2008 and continued through November 7, 2008.

On December 12, we met with Steve Etzel to review a report draft and discuss overall project objectives for future development, based on existing site constraints. As a result of that discussion, the final area of work for the project is considered to be all of the mill structure west of the "21" line as indicated on the building plans. Structure east of this point will be demolished. The overall project cost opinion will be modified to eliminate work east of the "21" line.

Resurgence Engineering and Preservation, Inc. performed limited invasive testing of the structure, but in many locations, we were able to closely observe the structure to locate damaged areas.

However, corrosion, or subgrade undermining may exist beneath concealed surfaces that appeared sound or in areas that were not visible during the inspection. This is typical of any older building.

This building shell is currently hampered by the fact that it remains open to weather, sits on water, has no heat, and is subject to freezing from ice below the first floor.

While this report may discuss the presence of potentially hazardous materials, it does not constitute a full assessment for these materials. Prior to any rehabilitation work, we recommend that you make yourselves aware of hazardous materials, including testing for lead, asbestos, other known hazardous materials.

For purposes of this report, the north side of the mill faces Depot Street. The south side faces the river. The west side faces Route 202.

For purposes of this report, a building element or component in *good* condition is performing its intended purpose, needs no repair, or has only a few minor cosmetic imperfections. A building element in *fair* condition shows anticipated signs of wear, but is still sound, or when up to 25 percent of the element needs to be replaced. A building element is considered to be in poor condition when the element no longer performs its intended function, needs major repair or greater than 25 percent replacement, or appears to be on the verge of failure.

3.0 DOCUMENT REVIEW

3.1 ORIGINAL CONSTRUCTION DOCUMENTS

There were no original construction documents available to review.

3.2 PREVIOUS STUDIES

We did not review the building for code compliance relating to architectural, life safety, electrical, mechanical, or hazardous materials.

Previous studies on the property include geotechnical reports by Oak Engineering, and site surveys by Northeast Civil Solutions. As NCS already has that information at their offices, it is not included in this report's appendix.

Oak Engineering performed geotechnical investigation before the adaptive use of the mill buildings was considered, so the information provided does not fully detail subgrade at the immediate mill site. Information gathered from subgrade profiles 1, 1.2, 2, and 3, dated May 2007 indicates that depth to the existing ledge changes substantially along the 386'+/- length of the mill buildings. Ledge depths varied from just below the slab surface at the east end of the mill, to up to 30 feet below the slab surface some 40 feet north of the mill near the junction of the three-story and two-story structures. Resurgence retained Summit Geoengineering to obtain and evaluate soil and ledge conditions immediately adjacent, and, where possible, inside the mill structure.

4.0 OBSERVATION, EVALUATION, RECOMMENDATIONS

4.1 SITE, TOPOGRAPHY, AND SUBGRADE

Observations and Evaluations:

The building site slopes downward to a basin in front of the north side of the buildings, and from the east toward the west. Eddy flow of the Presumpscot river runs directly below the westernmost 200 feet of the building along the south side (Photo #1.1), from column line 47 to column line 27. The current in the water below the mill appeared to flow back toward the west, or toward the power station. The water level varies with seasonal and floodwater control of the nearby dam. During the inspection period, water elevations along the south building wall varied by as much as two feet.

It is anticipated that any work on the Keddy Mill buildings will have to occur with little or no disturbance to the operations at the adjacent Sappi Power Station.

Summit Geoengineering performed soil borings, soil probes, and a test pit to determine soil conditions and ledge depths. Drawing S-1 in Appendix A of this report shows approximate boring, probe, and test pit locations. It also shows the approximate location of the river in relation to the building. An aerial photo in the Summit report also provides graphical information about the site layout. Please note that this aerial image predates the construction of the apartment complex at the corner of routes 202 and Depot Street.

The mill is sited in a backwater eddy of the river. Prior to construction of the mill, the existing grades were much lower than they are today, based upon the amount of debris that has been found in fill brought to the site around and within the building perimeter. Below this loose granular fill that contains construction debris, there are native silt strata, glacial till, and clay deposits that vary in depth to bedrock below.

The building sits over a section of ledge that is highly variable in contour. Near the east side of the structure, ledge is near the bottom of the ground floor slab. Ledge depth increases to nearly 30 feet below the top of the slab at the north side of the building, near column line 25. At the west end of the building, over the Presumpscot River, ledge depth below the floor slab was roughly 20 feet, with local variability.

Grade beams support the continuous exterior foundation wall. Piers (possibly, in some locations, pilecaps) support the foundation wall and grade beam. When excavating along one of the piers to try to locate piles, we could not find any piles, which leads us to conclude that the building is likely constructed on solid concrete piers. The fact that there is up to 10 feet of fill around the building and beneath the slab also supports this conclusion.

The building sits on piers spaced at approximately 24 feet on center over the water in the east-west direction, and at approximately 20 feet on center north-south. We could not determine if pilecaps support the building east of the "27" line, because the grade beams and piles are buried by fill on the outside, and isolated by concrete slabs inside the building. However, large concrete piers supporting the second floor penetrate the lower floor at 24 foot spacing. It is reasonable to assume that these are either founded on piles or are piers buried directly to ledge.

The site slope to the north of the building drops a significant quantity of rainwater along and into the building (Photo #1.6). Currently, this runoff drains through holes in the lower level slab and into the Presumpscot River. Site regrading and catch basins will be needed to control runoff. Because the final plan for the site is currently unknown, we will not consider these costs as they relate to the building foundation.

If the project proceeds and the building is rehabilitated, it may be likely that runoff from the extensive roof areas will need to be addressed. A forward-thinking architect could possibly incorporate roof runoff control into a green design that uses the runoff water for purposes such as site irrigation.

Recommendations:

- Develop site plan to shed water away from existing building.
- Consider use of roof runoof for "green" design applications.
- Perform other site improvements as dictated by site design and environmental requirements.

4.2 Seismic Design Issues

Observations and Evaluations:

Base seismic forces on a building depend upon the soil type beneath the structure, the building superstructure construction type, the building substructure type, the building occupancy, and the depth below foundations to bedrock. Soil types and depths include loose sands and marine clays, to a depth of between 15 and 26 feet below the finish floor of the building. Summit Geoengineering evaluated seismic subgrade parameters for the building considering the soil information that they gathered at the building site. The depth to ledge and type of fill present allows the seismic site parameters to be lowered from a more conservative site Class E to a site class D. At locations where the foundations bear directly on ledge, the seismic site parameter can be considered site class B.

Section 1614 of the International Building Code requires seismic evaluation for a property if it undergoes a change of occupancy.

Section [EB] 1614.2 Change of Occupancy, states:

[EB] 1614.2 Change of Occupancy. *When a change of occupancy results in a structure being reclassified to a higher seismic use group, the structure shall conform to the seismic requirements for a new structure.*

Exceptions:

1. *Specific detailing provisions required for a new structure are not required to be met where it can be shown an equivalent level of performance and seismic safety contemplated for a new structure is obtained. Such analysis shall*

consider the regularity, overstrength, redundancy and ductility of the structure within the context of the specific detailing provided.

2. *When a change of use results in a structure being reclassified from Seismic Use Group I to Seismic Use Group II and the structure is located in a seismic map area where S_{DS}<0.33, compliance with this section is not required.*

The conversion of the Keddy Mill to a multiunit residential structure does not change the Seismic Use Group of the building. The building, both as factory space and multiunit residential space, is classified by ASCE 7-02 as a Category II structure, which is included in Seismic Use Group I. However, Exception 2 (above), which also negates the requirements of this section, does so when considering a Short-Period Design Spectral Response Acceleration (S_{DS}) of less than 0.33g. At the Keddy Mill, the S_{DS} measures 0.37g. Therefore, it may be prudent to make the existing building conform to the seismic requirements of a new structure. Structural rehabilitation detailing can improve the seismic resistance of the foundation by adding inclined piles that tie into the existing grade beam or piers to increase stability if the underlying soils liquefy.

If the project proceeds, the upper stories of the building can also be strengthened to assist their ability to resist seismic forces. Some of the upper-level strengthening can be integrated into the design of the living spaces. Other strengthening can consist of the inclusion of several steel-framed braces between existing columns along the length of the long east building. Yet another, less invasive method could consist of carbon-fiber wrapping of critical column joints to improve seismic resistance.

While we have reviewed seismic requirements for the building, we have not performed a complete seismic evaluation of the structure. Such an evaluation would cost much more, and should only occur if the building foundations and superstructure appear capable of safely, durably, and economically supporting the rehabilitated building. It is notable that seismic maps have been updated in a manner that slightly reduces ground accelerations in the Portland, Maine area. The slight decreases in acceleration may be enough to significantly impact seismic design requirements for the structure. We have found that to be the case in similar projects in the Portland area.

Recommendations:

- Consider full seismic design requirements in more detail under provisions of building codes enacted at time of design. Discuss these issues with local building officials to gain appropriate approval of design codes early on in the design process.

4.3 Piers/Pilecaps, and Visible Grade Beams

Observations and Evaluations:

Large cast-in-place piers or pilecaps support the south building wall below column lines 47, 46, 43, 40, 39, 36, 33, 30 and 27. We could not determine how much more of the south building wall they support, but we know that the ledge becomes much closer to the surface further to the east. Piers or pilecaps also appear to support the interior columns where the building is constructed over water. We initially believed that timber piles supported the pilecaps, which in turn supported the grade beams, walls, and floors above.

Summit excavated a south wall "pilecap" at column line 24, to determine the size and number of piles supporting it. The excavation extended to a depth of five feet along the face of the "pilecap" without reaching its bottom (See Photos 4.1 through 4.6). Importantly, we also observed spiked-together lumber cribbing surrounding at least three sides of the "pilecap". Knowing that the depth from top of "pilecap" to ledge at this location is approximately 18 feet, we now believe that the building is constructed on square piers that extend down to ledge, instead of on timber piles. We believe this because the pier size (3'-6" x 4'-0") would not have been large enough to permit installation of a sufficient amount of timber piles to carry the heavy dead loads (nearly 200 kips) anticipated on the pile group, let alone heavy floor loads imposed by the industrial use.

Based upon Summit's calculations for the capacity of the piers, we believe that they are sufficient to carry gravity loads for the building. However, lingering concerns about building movement at the 40, 39, 36, and 33 lines causes us to suggest that additional piles be installed near the south wall piers at these locations. We suggest installing two 40-ton piles at each of the four locations, installed from the inside of the building. Since we also believe the settlement may occur where the depth to bedrock is deepest, we are considering these piles to be slightly longer, 30-foot sections.

The visible grade beams along the south building wall measured approximately 3'-0" high x 4'-0" wide. We observed structural distress at lines 40, 39, 36, and 33 (Photos 2.1, 2.2, 2.5, 2.8). In places, it appears that large steel beams or plates are encased in the concrete grade beam over the water (Photo #2.6). It is unclear whether these beams were used as primary reinforcement, or whether or not they were encased after being used to construct the extensive formwork needed to build the elevated slab.

We were unable to measure the interior grade beams due to the amount of water at the time of the inspections (Photo #2.7, Photo #3.7). What we were able to see of the interior beams were in good condition, and likely need little work.

Recommendations:

4.3.1 Repair south wall grade beam (approximately 167 lineal feet of exposed beam) over water. Due to access, repair prices will be high for this work. 167 feet x 3 feet x $100 per square foot = $50,000.

4.3.2 Install two new 40-ton piles at each of four locations along the south wall, at column lines 40, 39, 36, and 33. Consider two 30-foot long piles at each location with associated concrete removal and repair costs. Each Location: 60 lf piles at $60/lf plus $2,000 demolition + $1,900 concrete repairs and patching per location x 4 locations = $30,000

4.4 FOUNDATION WALLS

Observations and Evaluations:

Concrete foundation walls sit on top of the grade beams. The walls measure approximately seven feet high, and are 12 to 14 inches thick. Where the walls have been cut to install vehicle entrances, we observed steel longitudinal reinforcement in them. The walls show little evidence of significant structural distress over their length, aside from occasional minor cracking. There is some deterioration at the wall construction joints, which is not unusual for a structure of this age and construction type.

Summit extracted core samples of the basement walls in four locations as shown below.

CORE NUMBER	LOCATION	COMPRESSIVE STRENTGTH, f'_c psi	CHLORIDE ION CONTENT ppm
C1	Basement East Wall @ column line 5.5	3788 psi	<80 ppm
C3	Basement North Wall @ column line 21.5	5138 psi	<80 ppm
C6B	Basement South Wall @ column line 40 (2cores)	4026 psi	<80 ppm
C8	North Wall, Outside Column near line 40	4237 psi	Not taken

Based upon our observation of these walls, review of tested compressive strengths, and tested level of chloride ion contents, we believe that they can remain as a critical part of the structure to distribute lateral loads to the grade beams and piers.

The westernmost wall of the building clearly remains from an earlier structure built at the site (Photo #3.2). It is a brick masonry and rubble stone wall, with supplemental cribbing and concrete block masonry. Review and analysis of this wall was not part of our project scope. We believe that this wall is of little structural value by itself, and should be used as a form to construct an inboard cast-in-place concrete wall properly supported by piles and tied back laterally into the existing soil and, possibly, the large boiler structure remaining in the western building.

The easternmost retaining wall at column line 5.5 shows a small amount of undermining. Since it will be demolished, there will be no costs associated with repairs.

Recommendations:

4.4.1 Repair south foundation walls where necessary above grade beams. Limit the number of new openings cut into these walls. Primary repairs will be at the south side of the building over the river. Allow $21,000.

4.4.2 Replace existing CMU infill on north foundation walls between concrete columns at three-story west building. Area 72 feet x 14 feet high x $32 per square foot. Allow $26,000.

4.4.3 <u>Column lines 21 through 39:</u> Periodically brace tops of foundation walls laterally to internal columns supporting second-floor. 6 locations, 2 sides per location, $1,500 per side, total of $18,000.

4.4.4 Build a new retaining wall at the west end of the building, 20 feet high x 76 feet long, supported on piles and tied back into the existing soils. $250,000.

4.4.5 Build a new end wall frame at the "21" line that ties to existing grade beams. $15,000.